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projecting stem tip and a meristematic region that later develops such a tip are of the same ontogenetic significance, and therefore that a cotyledonary ring may be lateral even if the stem tip is not organized. The cells that are to organize it later are still apical. It certainly also gives a simpler and more consistent interpretation of the grass embryo than to imagine a cotyledon consisting of such distinct structures as scutellum, epiblast, and coleoptile, distinct in origin as well as in position and appearance. The author disposes of the dicotyledonous embryo of *Agapanthus* as meaning a "progressive" character, from which we are to infer that he still maintains the view that the dicotyledons have been derived from the monocotyledons. We had assumed that this view was no longer under discussion.—J. M. C.

Temperature and viability.—WAGGONER²⁴ finds that the resistance of radish seeds to high temperature is inversely proportional to the initial water content at the time of heating. At effective temperatures the water content fell with duration of heating. Three different varieties studied showed similar resistance. WAGGONER finds that much of the past work on resistance of seeds to high temperatures lacks precision because the operators allowed the water content to vary greatly during heating. They heated in water in open dishes, in the oven, or in dry corked flasks. The water absorbed or given off by radish seeds during heating as determined by the use of one or the other of these methods goes far to determine their resistance to heat. GROVES²⁵ has taken care of this source of error by securing his seeds gas-tight in tubes just large enough to hold the 100 seeds, thus leading to a rapid rise of vapor pressure with heating and an equilibrium between the vapor of the air and the water content without measurable water loss. It is interesting to see that radish seeds can be dried down to 0.4 per cent moisture without injury, for EWART²⁶ has concluded that the sorts of seeds that are most resistant to drying cannot withstand a moisture reduction below 2 or 3 per cent without injury; while *Oxalis*, *Salix*, and *Populus* will not withstand any drying in a desiccator.—WM. CROCKER.

Organic nutrition of plants.—KNUDSON²⁷ has investigated the influence of certain mono- and disaccharides, added to nutrient media, on the growth of various green plants, as corn, peas, radish, vetch, etc. These plants can absorb through the root system and utilize sugars in growth. The order of the sugars with reference to beneficial effects varied with the kind of plant. Thus with corn grown in the light, the order was glucose and fructose, saccharose, maltose;

²⁴ WAGGONER, H. D., The viability of radish seeds (*Raphanus sativus* L.) as effected by high temperatures and water. Amer. Jour. Bot. 4:299-313. fig. 1. 1917.

²⁵ BOT. GAZ. 58:169-189. 1917.

²⁶ Ewart, Proceedings and Trans. of the Liverpool Biol. Soc. 10:185-193. 1896.

²⁷ KNUDSON, LEWIS, Influence of certain carbohydrates on green plants. Cornell Agric. Exp. Sta. Mem. 9:1-75. 1916.

while with Canada field peas it was saccharose, glucose, maltose. lactose. Timothy was found to utilize lactose when grown in darkness, but not when grown in light. The influence of the sugars upon the rate of respiration in the vetch was observed, with the result that saccharose, glucose, and maltose accelerate respiration very noticeably, the latter somewhat less than the other two. Galactose was found to be toxic to wheat, peas, corn, and vetch, even at low concentrations; while glucose antagonizes the toxicity of galactose, possibly by rendering the roots impermeable to galactose, or by altering galactose metabolism in such a way as to prevent formation of toxic oxidation products. The author suggests as a general conclusion that soluble organic substances produced from humus during decay may play a more important rôle in the organic nutrition of plants than we have hitherto thought.—CHARLES A. SHULL.

Osmotic pressure in parasite and host.—Using the cryoscopic method, HARRIS and LAWRENCE²⁸ have studied the osmotic relations between 7 species of Jamaican mistletoes and their 19 hosts. They find that the sap concentration of the chlorophyllous tissues of the parasite is nearly always higher than that of the mature leaves of the host, the parasites showing an average concentration equivalent to 14.43 and the hosts to 13.59 atmospheres of osmotic pressure. This relationship is not a necessary one, however, for in several cases the parasites possessed sap of a lower concentration than their hosts. In such cases it is assumed that the host supplies more than sufficient water to meet its own needs, so that the parasite is not in direct competition with the leaves of the host, but merely secures water from the same transpiration stream. In cases of secondary parasitism, the osmotic pressure increases from host to primary and from primary to secondary parasite. The sap from the stems of leafless species of *Dendrophthora* possesses a lower concentration than that from leaves of species of *Phoradendron* and *Phthirusa*. The meaning of this is not discussed. It may involve differences in the rate of photosynthetic activity in the leafless and leafy forms.—CHARLES A. SHULL.

Galls.—ESSIG²⁹ calls attention to the introduction of the chrysanthemum gall fly from Europe. This pest was not known in the United States previous to 1915. It causes cone-shaped galls which often distort the shoot beyond recognition, and eventually causes death of the infected parts. It sometimes destroys one-third of the crop.

WELLS³⁰ gives us a very important study of the galls of the blackberry. The purpose of the paper is threefold: (1) a study of the histology of the galls;

²⁸ HARRIS, J. ARTHUR, and LAWRENCE, JOHN V., On the osmotic pressure of the tissue fluids of Jamaican Loranthaceae parasitic on various hosts. Amer. Jour. Bot. 3:438-455. 1916.

²⁹ ESSIG, E. O., The chrysanthemum gall fly, *Diartbronomyia hypogaea* F. Low. Jour. Econ. Ent. 9:461-468. 1916.

³⁰ WELLS, BERTRAM W., The comparative morphology of the zoocecidia of *Celtis occidentalis*. Ohio Jour. Science 16:249-290. pls. 8. 1916.